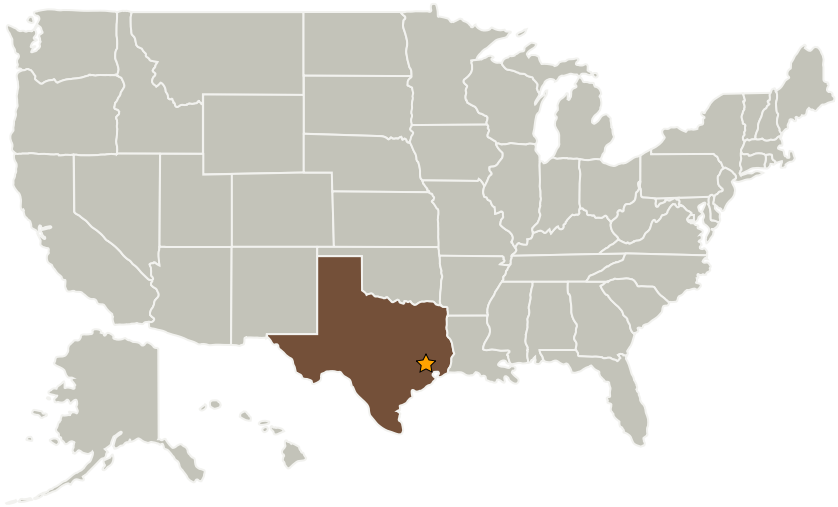
Investigation of Virtual Digital Human and Robotic Device Technology Merger Complimented by Haptics and Autostereoscopic Displays, Phase I

Completed Technology Project (2004 - 2005)

Project Introduction

The proposed innovations conform precisely to the technology needs described in Subtopic T5.02, Robotics and Virtual Digital Human Technologies. ?Two potential areas for research are the ever-evolving robotics and 3-D simulation technologies providing operational robustness and intelligence.? Our proposal explicitly addresses two of the ?specific technology requirements?: the application of haptics for improved operator awareness of and reaction to robotic activity; and the introduction of stereographic display systems for optimized operator visual situational awareness. We extend our proposal?s relevance by ?offering innovation in the form of 3-D visualization and simulation capabilities of robotic systems with relation to the 3-D virtual-digital-human-in-the-loop concept.? Our VDH technology can place realistic virtual humans working collaboratively with virtual Robonauts in synthetic environments that emulate Space Station or Space Shuttle. Finally, we propose to address the application targets of ?flight and ground operations development, analyses, training and support? by incorporating gravitational force as a variable in the simulation environment, offering the design of highly realistic tests that ?improve the ability of humans and computers to seamlessly control robotic systems?. The Phase I investigation could result in opportunities for design enhancement of the robotic devices themselves.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
HPN Software Consultant, Inc.	Supporting Organization	Industry	Houston, Texas

Primary U.S. Work Locations
Texas

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.4 Mission Success Technologies
    - TX13.4.2 Team Preparedness and Training